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REPORT
of the
MINUTES OF THE MEETING OF THE NORTH CENTRAL CORN BREEDING
RESEARCH COMMITTEE

Chicago, Illinois
March 2-3, 1966

Reported by
William R. Findley,
Acting Secretary

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Crops Research Division
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TABLE OF CONTENTS

	Page
MORNING SESSION, March 2 -----	1
COMMITTEE REPORTS	
Report of the Sub-committee on Grouping of Lines for Breeding Purposes -----	2
Recent Inbred Releases -----	5
Report of the Sub-committee on Uniform Tests on Stability and Genotype-Environmental Response of Hybrid Types-----	6
Report of the Sub-committee on Corn Rootworm Studies-----	7
Report of the Sub-committee on Maize Dwarf Mosaic Virus-----	9
AFTERNOON SESSION, March 2 -----	12
MORNING SESSION, March 3 -----	12
Testing Corn Hybrids at Various Plant Populations-----	13
Testing of Corn Hybrids at High Populations and Narrow Rows----	14
COMMITTEE REPORTS	
Report of the Sub-committee on Meeting Place -----	15
Report of the Sub-committee on Uniform Tests in the 900 Maturity Series -----	15
Report of the Sub-committee on Uniform Tests in the 700-800 Maturity Series -----	15
Report of the Sub-committee on Uniform Tests in the 400-600 Maturity Series -----	18
Report of the Sub-committee on Uniform Tests in the 100-300 Maturity Series -----	23
Report of the Sub-committee on Maize Dwarf Mosaic Virus-----	30
Report of the Sub-committee on Stability and Genotype- Environmental Responses of Hybrid Types -----	30
MEMBERSHIP OF SUB-COMMITTEE-----	33
ROSTER OF ATTENDANCE -----	34

NORTH CENTRAL CORN BREEDING RESEARCH COMMITTEE

MORNING SESSION, March 2

The North Central Corn Breeding Research Committee was called to order by Chairman L. F. Bauman in the Caracas Room, Sheraton-Chicago Hotel at 9:00 a. m. A nominating committee was appointed consisting of J. H. Lonnquist, Chairman; E. J. Dollinger and W. A. Russell.

The time and place of next year's meeting was discussed. A suggestion was made to consider a meeting time coinciding with the meeting of the Hybrid Seed Corn Division, American Seed Trade Association. After more discussion Dr. E. C. Rossman MOVED the North Central Corn Breeding Research Committee meeting be held at this same time next year.

Seconded by E. J. Dollinger and PASSED.

Chairman Bauman asked Paul Crane to investigate the possibilities of using this room next year.

J. C. Sentz MOVED a committee be appointed to consider the organization function, and future emphasis of the North Central Corn Breeding Research Committee and its relationship to other NCR committees concerned with related problems.

The motion was seconded by J. H. Lonnquist.

It was suggested that Director N. J. Volk, Administrative Advisor, who would be attending the March 3 morning session, be asked to express his views on meetings of this sort.

M. S. Zuber MOVED the motion be tabled for consideration the following morning.

Seconded by W. A. Russell and PASSED+

Chairman Bauman then called for reports from the standing Sub-committees.

REPORT OF SUB-COMMITTEE ON GROUPING OF LINES FOR BREEDING PURPOSES

Dr. W. A. Russell, Chairman of this committee compiled the following report and presented it for including in the minutes.

The grouping of inbred lines has been brought up to date about once every 3 years. The last grouping was in 1964. This sub-committee has been responsible for listing synthetics available at the experiment stations in the North-Central Region. The list to follow includes those synthetics not included in the 1960 report.

Illinois

Alexander High Oil Synthetic--recurrently selected from a 2-generation random mated bulk of 56 open-pollinated varieties. Mean oil content of original population--4.4%; 5th cycle--8.4%.

Disease-Oil Synthetic--recurrently selected primarily for oil content from a random-mated population made up of a bulk of 31 inbreds and individual ears from four of Wernham's synthetics. Original population selected for resistance to H. turcicum, H. maydis and Diploidia. Mean oil content of original population--4.2%; 3rd cycle--6.8%.

Indiana

Corn Belt x Southern A (Purdue)--The ten Corn Belt inbreds A295, I205, H49, WF9, 38-11, Oh43, H51, W32, C103 and B41 were crossed into composite single crosses with approximately 30 inbreds from southern U.S. The single crosses were made into composite double crosses and then allowed to interpollinate in isolation for two years.

Corn Belt x Southern B (Purdue)--The ten Corn Belt inbreds A297, B14, H55, H60, Oh07, M14, Ms24, W22 and Hy were crossed into composite single crosses with approximately 30 inbreds from southern U.S. These single crosses were made up into composite double crosses and then allowed to interpollinate in isolation for two years.

Iowa

Synthetic AA--57 Corn Belt inbreds, representing a thorough sampling of the best lines available from Corn Belt breeding programs, were made in a restricted set of diallel crosses. A seed composite of the single crosses was grown in isolation one generation followed by two generations of random mating with hand pollination. The synthetic was developed to provide a broad genetic base of improved germ plasm to be used in quantitative genetic studies.

Synthetic BB--44 Corn Belt inbreds, representing a thorough sampling of the best lines available from Corn Belt breeding programs, were made into a restricted set of diallel crosses. A seed composite of the single crosses was grown in isolation one generation followed by two generations of random mating with hand pollination. The synthetic was developed to provide a broad genetic base of improved germ plasm to be used in quantitative genetic studies.

Elite Line Synthetic #1--The following 12 inbred lines--R181, A257, A619, R168, C103, R14A, B52, B54, B55, B56, B57 and (Minn. Syn. #1) Sel. 24--were combined into six single crosses. These single crosses were combined into all possible double-crosses, followed by random mating in a composite population using hand pollination, and then one generation in isolation. The population contains considerable genetic variability for both date of silking and rate of moisture loss, and intended for use in a mass selection program on rate of moisture loss during grain maturation.

High Oil Synthetic #1--Ford's Hi Oil Synthetic and Indiana Synthetic A were crossed and the population random mated several generations using hand pollination. This synthetic was developed to provide a population with considerable genetic variability for oil content of the grain, and intended for use in studies on the inheritance of oil content and its correlation with other agronomic traits.

High Oil Synthetic #2--Waxy Os420 Hi Oil Synthetic and Indiana Synthetic B were crossed and the population random mated twice using hand pollination. This synthetic was developed to provide a population with considerable genetic variability for oil content of the grain, and intended for use in studies on the inheritance of oil content and its correlation with other agronomic traits.

(Tuxpeno x Lancaster)^{2/} Synthetic--Developed to provide a population containing some exotic germ plasm. One-fourth of the germ plasm of this synthetic was derived from the Mexican race, Tuxpeno; and three-fourths, from the U.S. variety Lancaster Surecrop. The original back-cross was random mated several generations followed by one cycle of recurrent selection for yield based on the performance of S_1 lines.

Stiff Stalk Synthetic #2--Derived from a cross of two strains of Stiff Stalk Synthetic both of which had undergone several cycles of recurrent selection for yield. The synthetic has been random mated once by hand pollination.

Corn Borer Synthetic #4--This synthetic was developed after three cycles of recurrent selection in Iowa Synthetic A for resistance to leaf feeding by the European corn borer. Initial evaluation indicates that this synthetic has a high potential as a source of lines with satisfactory resistance to leaf feeding.

Corn Borer Synthetic #5--This synthetic was developed after three cycles of recurrent selection in Iowa Synthetic B for resistance to leaf feeding by the European corn borer.

Corn Borer Synthetic #6--This synthetic was developed after three cycles of recurrent selection in Pennsylvania Early Synthetic for resistance to leaf feeding by the European corn borer.

Corn Borer Synthetic #7-- This synthetic was developed after three cycles of recurrent selection in Pennsylvania Intermediate Synthetic for resistance to leaf feeding by the European corn borer.

Corn Borer Synthetic #8--This synthetic was developed after three cycles of recurrent selection in Pennsylvania Late Synthetic for resistance to leaf feeding by the European corn borer. Initial evaluation indicates that this synthetic has a high potential as a source of lines with satisfactory resistance to leaf feeding.

The Iowa Corn Borer Synthetics #4 to #8 were developed as follows: In each cycle of recurrent selection approximately 100 S_1 progenies from the previous cycle were manually infested with corn borer egg masses, and later these plots were rated for relative amount of leaf feeding. Remnant seed of the 10 most resistant S_1 progenies were crossed into a set of 45 single crosses. These single crosses were grown the following year as a source of S_1 's for the next cycle of recurrent selection.

Virginia

Long Ear Synthetic--Crosses were made among the lines B33, 111, M14, Oh29, Oh45, CI03, K155, W24 and CI61. It has been maintained primarily by mass pollination by hand with selection for disease resistance, low ears and prolificacy. It has been used in recurrent selection studies with selection based on combining ability and S_1 progeny yields, and synthetics are available from these selection studies.

Mexican Races Synthetic--The population has been maintained in isolation with no addition of Corn Belt germ plasm. Selection has been limited to yellow endosperm, standability, and mature seed.

Wisconsin

No synthetics available as such. However, there is available selections, grown two years in Wisconsin, of some tropical material originally developed by Dr. Wellhuasen, Rockefeller Foundation, Mexico. Additionally, there is available S₁ and/or B_{x1} progenies of the tropical selections outcrossed to several Wisconsin inbreds.

E. C. Rossman MOVED that the Sub-committee on Grouping of Lines for Breeding Purposes be assigned the responsibility of annually compiling a list of inbred releases during the preceeding year and this list be made a part of the minutes.

The motion was seconded by A. J. Ullstrup and PASSED.

A sheet was then circulated to obtain information on recent inbred releases. The list follows:

RECENT INBRED RELEASES

<u>State</u>	<u>Inbred</u>	<u>Pedigree</u>	<u>Remarks</u>
Illinois	R801	(B14 x Ill.High Oil)B14 S ₅	Developed by D.E.
"	R802	(B37 x Ill.High oil)B37 S ₄	Alexander for higher
"	R803	(C103 x Ill.High oil)C103 S ₆	oil content
Iowa	B59	N32 x B14 ² /	
"	B64	41:2504B x B14 ³ /	Genetic stock
"	B65	Recovered WF9	
Minnesota	A629	(V3 x WF9)WF9	Released in 1964
"	A630	(All6 x WF9)WF9 ³ /	
"	A631	(A509 x WF9)WF9 ³ /	Released in 1964
"	A632	(Mt42 x B14)B14 ³ /	Released in 1964
"	A634	(Mt43 x B14)B14 ³ /	
"	A635	(ND203 x B14)B14 ² /	Released in 1964
"	A636	(ND203 x B14)B14 ² /	
Missouri	Mol7	C103/187-2	
Ohio	Oh7K	(Oh41 x 38-11)Oh7A	Released for breed-
"	Oh422	Midland variety	ing purposes, re-
"	Oh26F	9/16-Oh26, 5/16-Oh51A, 1/16 Oh51, 1/16 Oh56A	sistant to MDM
Penna.	Pa884P	K155 x A231	Released in 1965 on 3-yr. delay release policy

Some discussion followed relative to the dissemination of information on new inbred releases.

E. C. Rossman then MOVED the Sub-committee on Grouping of Inbred Lines for Breeding Purposes investigate possibilities of publicizing new inbred releases including brief descriptions in Crop Science and American Seed Trade publications.

Seconded by R. J. Lambert and PASSED.

REPORT OF THE SUB-COMMITTEE ON UNIFORM TESTS OF STABILITY
AND GENOTYPE-ENVIRONMENTAL RESPONSE OF HYBRID TYPES

Dr. Russell asked for suggestions anyone might have on improving the stability test being continued and stated the committee would report back.

REPORT OF THE SUB-COMMITTEE ON UNIFORM TESTS ON CORN ROOTWORM

D. B. Shank passed out the following committee report prepared by Chairman P. J. Fitzgerald, who could not be present.

There were no regional rootworm trials in 1965 but inbred lines nominated for the 1965 and 1966 three-way test cross evaluations were included in rootworm trials at Yankton and Lake Preston, South Dakota.

Infestation throughout the region was generally low but adequate populations at Yankton and Lake Preston permitted the evaluation of lines. Larval counts during the second week of July averaged 23.9 at Yankton with a range of 0 to 85 larvae in 89 samples. The following week at Lake Preston counts averaged 17.8 larvae per sample with a range of 0 to 92 in 78 samples. All counts were taken in a seven inch cube of soil containing one plant.

Line ratings were made in single-row plots 25 feet long in two replications and at two stages of development (July 27-28 and August 17-18 at Yankton; August 12 only at Lake Preston). Ratings of 1.0 indicate a minimum of damage while a rating of 5.0 reflects severe damage to all or most of the plants within the row.

Results in table 1 indicate that performance of the lines were generally poor, but some of the lines showed a degree of tolerance and should be retested. Under a more moderate infestation, several of the lines would probably be acceptable. Ratings at Lake Preston should be viewed with caution since this nursery was under drought stress from late June until the middle of September.

Conditions in the Yankton test were severe. Localized areas of heavy infestations resulted in poor ratings of some of our best inbreds. The average rating of a commercial double-cross hybrid check in this area of the nursery was 3.9. In view of these conditions it is recommended that these lines be retested in 1966. Lines must be re-submitted as seed is not available to the testing station.

Table 1. Performance under rootworm infestation of inbred lines of corn nominated for three-way test-cross evaluations in 1965 and 1966. Yankton and Lake Preston, South Dakota^{1/}

Entry	Source	Rating 2/										
		Response to Larval Damage							Adult Feeding			
		Yankton			Lake Preston				Yankton			
		I	II	Ave.	I	II	Ave.	I	II	Ave.		
	1	1	2	2	1	1	1	1	1	1	1	
A643	Ia. Syn. A.	4	5	3	5	4.3	2	4	3.0	5	3	4.0
A646	Minn. Syn. 3	3	5	3	5	4.0	1	3	2.0	3	2	2.5
A648	Minn. Syn. 3	4	4	2	4	3.5	1	4	2.5	5	5	5.0
Ms 57	W10 x Oh40B	3	2	3	4	3.0	1	3	2.0	-	-	-
Ms 80	Michigan	5	4	3	3	3.8	2	3	2.5	2	1	1.5
Ms 92	(Oh40B x R53)R53	5	5	5	4	4.8	4	5	4.5	5	5	5.0
Ms 100	(Oh40B x 38-11)Ms1334	2	4	1	3	2.5	2	3	2.5	2	2	2.0
Ms 142	Michigan	3	2	1	1	1.8	2	2	2.0	-	-	-
Ms 215	Michigan	3	4	2	5	3.5	3	3	3.0	-	-	-
Mich. 64-1	8-line Syn.	5	3	5	3	4.0	2	4	3.0	2	4	3.0
Mich. 64-2	Michigan	5	4	3	4	4.0	1	2	1.5	3	2	2.5
Mich. 64-3	Michigan	5	5	-	5	5.0	3	-	3.0	-	3	3.0
Mich. 64-4	Michigan	3	4	3	4	3.5	-	4	4.0	-	-	-
Mich. 64-5	Michigan	5	5	4	5	4.8	4	5	4.5	3	5	4.0
Mich. 64-6	Michigan	5	5	4	5	4.8	4	5	4.5	4	4	4.0
H85	Indiana	5	5	5	5	5.0	5	5	5.0	2	2	2.0
H86	Indiana	3	5	4	-	4.0	2	5	3.5	2	-	2.0
H87 *	A295 x C.I.90A											
H88 *	Oh43 x C.I.90A											
H89 *	Bl4 x G.E.440											
H90	Indiana	3	3	3	1	2.5	3	4	3.5	3	1	2.0

Table 1. Continued.

Entry	Source	Rating 2/									
		Response to Larval Damage					Adult Feeding				
		Yankton					Lake Preston				
		I	II	I	II	Ave.	I	II	Ave.	I	II
		1	1	2	2		1	1		1	1
Ind. 9-17 *	Syn. B										
Ind. 59-13 *	Syn. B										
E 43-5 *	Oh43										
E38-11-11-5		3	5	2	3	3.3	2	3	2.5	5	5
Efg 24-8		4	2	2	3	2.8	3	5	4.0	3	3
N 7a		3	5	3	4	3.8	3	2	2.5	2	3
N 7b		1	5	2	4	3.0	3	3	3.0	3	3
N 8a		4	3	4	3	3.5	3	3	3.0	2	2
N 8b		2	5	4	4	3.8	3	1	2.0	2	3
N9-1336 *	N6 x Hays Golden	5	5	5	5	5.0	4	4	4.0	-	-
N8-1613 *	Barkers Reid Y.D.	2	4	3	3	3.3	4	3	3.5	-	-
N0-1030 *	M14 x 187-2	5	5	5	5	5.0	1	3	2.0	-	-
Pa41 *	Pennsylvania	4	5	4	4	4.3	3	4	3.5	-	-
Pa65-1	Clarage	5	5	5	5	5.0	4	4	4.0	-	-
Pa65-2	Sprague Gehu Flint	3	3	5	5	4.0	3	2	2.5	-	-
HD 2187		3	2	4	2	2.8	2	2	2.0	4	4
HD 2271	Ia. 63:1255	1	4	1	4	2.5	1	1	1.0	3	2
HD 2479	Ia. 63:1261	4	5	2	5	4.0	2	4	3.0	5	5
YuBc-4 *	Wf9 x M14	3	3	4	2	3.0	3	4	3.5	-	-
SD 15A *	Rec. Oh56A	2	4	2	4	3.0	2	3	2.5	4	4

1/ Lines evaluated in single-row plots in two replications on July 27-28 and August 17-18 at Yankton and only on August 12 at Lake Preston. Infestations at both locations ranged from light to heavy with poor uniformity. Ratings at Lake Preston probably confounded by droughty conditions from late June until middle of September.

2/ Rating : 1.0 = excellent; 2.0 = good; 3.0 = poor; 4.0 = very poor; and 5.0 = unacceptable.

3/ * - Nominated in 1964 for 1965 test. In some cases not tested for rootworm in 1965. Seed of entries Ind. 8-17.

V. L. Ferguson was asked to contact Dr. Fitzgerald to determine lines that should be retested

REPORT OF THE SUB-COMMITTEE ON MAIZE DWARF MOSAIC VIRUS

At the virus conference held at Purdue University in November, Dr. F. A. Loeffel was asked to develop a uniform rating system for evaluating corn strains to virus. The scheme presented in the following motion has been approved by the Southern and Northeast Corn Improvement Conferences.

Dr. Loeffel MOVED as follows:

A nine class rating scale, classes 1 to 9, be used for evaluating the relative reaction of corn strains to virus.

Description

Class 1	no visible virus symptoms
Class 2,3,4	
Class 5	easily discernible symptoms, some leaf discoloration and moderate shortening of internodes

Maize dwarf mosaic virus ratings were made on segregating generations in southern Indiana and at Frankfort, Kentucky and Portsmouth, Ohio; and on in-bred lines entered in uniform performance trials at the additional locations of McClure, Illinois and Vanceburg, Kentucky. Late chlorosis ratings are summarized in the accompanying tables, 2 and 3.

A high incidence of natural MDM infection occurred in the Illinois, Kentucky and Ohio plots. In Indiana inoculation produced fairly uniform infection, but stunting generally was not severe and vigor not greatly reduced.

F. A. Loeffel
A. J. Ullstrup
W. R. Findley, Chairman

Table 2. MDM Chlorosis ratings of progeny groups summarized as frequency distributions on a percentage basis, 1965.

Progeny Group		MDM Ratings			Total plants
		1	2	3	
(Oh43 x Oh07)-S	Ind.	41	39	20	145
	Ky.	4	3	93	123
	Ohio	28	19	53	204
		<u>26</u>	<u>21</u>	<u>53</u>	<u>472</u>
(Oh43 x Oh07)Oh43	Ind.	17	38	45	179
	Ky.	1	1	98	139
	Ohio	16	33	51	228
		<u>13</u>	<u>27</u>	<u>60</u>	<u>546</u>
(WF9 x P8)-S	Ind.	16	49	36	146
	Ky.	1	4	95	157
	Ohio	8	36	56	194
		<u>8</u>	<u>30</u>	<u>62</u>	<u>497</u>
(B37 x Pa32)-S	Ind.	42	51	7	161
	Ky.	21	13	66	102
	Ohio	53	18	29	211
		<u>42</u>	<u>28</u>	<u>30</u>	<u>474</u>
(C103 x Oh07)C103	Ind.	47	37	16	152
	Ohio	39	19	42	162
		<u>43</u>	<u>28</u>	<u>29</u>	<u>314</u>
(Oh07 x Oh43E)Oh07	Ind.	81	19	0	124
	Ky.	28	10	62	133
	Ohio	76	9	15	152
		<u>62</u>	<u>13</u>	<u>25</u>	<u>409</u>

Table 3. MDM rating of inbred lines in uniform tests evaluated in one or more States of Illinois, Indiana, Kentucky, and Ohio in 1965.

Inbred	MDM Ratings				Greenhouse
	<u>Ill.</u>	<u>Ind.</u>	<u>Ky.</u>	<u>Ohio</u>	<u>Ind.</u>
R217	1.0	1.0	2.3	2.0	
R218	3.0	3.0	2.8	D	3.4
R220	3.0	1.0	2.8	2.8	
H85	3.0	3.0	3.0	2.8	4.0
H86	3.0	2.5	2.7	2.3	1.0
H90	1.5	2.0	2.0	2.3	
EF9-24-8	3.0	3.0	2.8	2.8	1.3
E38-11-11-5	1.5	1.5	2.0	1.8	0.6
N7A	1.8	2.0	2.0	1.8	1.9
N7B	1.0	1.0	1.0	1.1	0.3
N8A	1.5	1.5	2.5	2.0	2.0
N8B	3.0	3.0	3.0	3.0	1.5
MS57		2.0		2.5	
MS80		2.0		2.3	
MS92		1.5		D	
MS100		1.0		2.0	
MS142		2.5		D	
MS215		1.5		2.5	
Mich.64-1		3.0		2.8	
Mich.64-2		1.5		D	
Mich.64-3		1.5		2.5	
Mich.64-4		1.5		2.0	
Mich.64-5		2.0		D	
Mich.64-6		2.0		D	
Mich.65-1		3.0		D	
A643		1.0		2.3	
A646		2.0		D	
A648		2.0		D	
Oh61:6186			3.0	2.3	
Oh61:6210			2.8	2.8	
Oh61:5011			2.8	3.0	
Oh61:6160				D	
Ia.63:1255			2.8	2.8	
Ia.63:1261			2.5	3.0	
W8A-R				D	
WM14R				3.0	
W174				D	
W408A				2.8	
W410A				2.0	

Class 6, 7, 8

Class 9 severe symptoms, highly chlorotic, extreme leaf discoloration and extreme shortening of internodes.

Classes 2, 3, 4, 6, 7, and 8 are intermediate classes.

If an investigator prefers a five-class scale, classes 1, 3, 5, 7, and 9 will be used to classify material. Similarly classes 1, 5, and 9 will be used if a three-class scale is desired. If this procedure is followed ratings made independently by different investigators could be easily averaged and summarized.

The motion was seconded by M. S. Zuber and PASSED.

AFTERNOON SESSION, March 2

The afternoon session was devoted to special topics. The following were discussed:

Effect of exotic germplasm on genetic variances and behavior of maize varieties, by Dr. J. H. Lonnquist.

Maize selection by inbred line appearance and test-cross performance in high and low plant densities, by Dr. W. A. Russell.

Kernel red-stripe on maize, by Dr. Lansing Williams.

Gibberella ear rot and feeding problems, by Dr. A. J. Ullstrup.

MORNING SESSION, March 3

Chairman L. F. Bauman called the morning session to order at 8:30 a.m. He then introduced Dr. N. J. Volk, Administrative Advisor.

Director Volk discussed the proposed Federal budget cuts as these will affect program planning. He commented favorably on the attitudes of the Directors toward the NCR Committees.

Chairman Bauman then called on Dr. E. C. Rossman to lead a discussion on plant population studies.

Doctors E. C. Rossman and E. E. Gamble discussed the subject of testing with narrow rows and high populations, including hybrid interactions. Summaries of their presentations follow:

Commercial and experimental corn hybrids have been tested at two or more plant populations in Michigan since 1947. A review was presented in 1955 (Proceedings 10th Annual Hybrid Corn Industry-Research Conference p. 18-23). Interactions of hybrids x populations were usually but not always significant. All correlations, except one, of yields at two populations in 11 comparisons were highly significant. In general, high yielding hybrids at the low population tended to be in the high yielding group at the higher population. Significant correlations did lend confidence that the general practice of testing at only one population had not been grossly in error. There were enough exceptions, however, that it seemed desirable to continue to evaluate at two or more plant populations in order to develop and recommend hybrids adapted to specific populations. Early maturing hybrids responded more to increased population than late maturing hybrids. Correlations of maturity with percent increase in yield were significant. Here too, there were notable exceptions.

Correlations of yield at two populations in more recent comparisons (Table 4) in Michigan, Iowa, and Virginia are highly significant. In most cases, the high yielding hybrids at the low population were also high yielding at the high population.

Table 4. Some correlation coefficients with corn yields of hybrids at two plant populations.

		No. of hybrids	Populations		Average yields	Correla- tion
<u>Michigan</u> ^{1/}						
Monroe County	1964-1965	37	15,400	19,900	98; 86	.592**
Ingham county	"	34	16,200	20,700	62; 58	.767**
Saginaw county	"	30	15,300	19,100	65; 62	.765**
<u>Iowa</u> ^{2/}						
District 1	1964-65	31	16,000	21,000	95; 91	.840**
District 2	"	35	16,000	21,000	99; 97	.688**
<u>Virginia</u> ^{3/}						
Holland	1965	64	14,000	21,000	131; 143	.986**
Warsaw	1965	64	14,000	21,000	141; 156	.902**

1/ Corn hybrids compared for 1966. Michigan Ext. Bull. 431. 1966.

2/ 1965 Iowa corn yield test. Iowa Bull. P-136. 1966.

3/ Corn performance tests in Va. in 1965. Va. Res. Rptr. 103. 1965.

At Guelph, evidence has been accumulated (Tanner, unpublished) which suggests that corn grown at row widths less than 20 inches and with a higher plant population than used with wide-row plantings will have superior yield performance. The superior performance is largely attributed to better interception of sunlight. Hybrids used, in Ontario, are generally smaller because of their early maturity and, furthermore, early planting which is presently recommended develops smaller plants. These two factors permit more plants to be grown per acre in narrow rows without competition amongst plants for available sunlight.

Results obtained to date indicate that some hybrids will perform better under narrow rows and high populations than other hybrids. This means that hybrids would have to be tested under both wide and narrow row conditions. In combined analyses of tests of 25 hybrids, the test x variety interaction mean square was significant in some comparisons but, generally was less than 20% in magnitude of the variety mean square.

Correlation coefficients calculated from yield data of 25 hybrids grown in wide rows and narrow rows varied from 0.649 to 0.796 and all were significant. The latter two facts would suggest the relative performance is not radically different in the two tests. More data is required to clarify the possible interaction of hybrid performance at wide and narrow row widths.

Morphological measurements have been made on several hybrids grown in wide and narrow row tests in order to determine if morphological differences might be used as a means of distinguishing hybrids which would perform better in narrow rows and high populations. This data has not been completely analysed and conclusions cannot be drawn at this time.

Studies on interplot competition between a tall, late hybrid and a short, early hybrid indicate that with row widths less than 20 inches at least a three-row plot, with the center row being harvested, should be used.

J. C. Sentz MOVED to remove the tabled motion of the March 2 morning session relative to functions of the committee. The motion was seconded by J. H. Lonnquist and PASSED.

The Secretary then read the motion made by Dr. Sentz and seconded by Dr. Lonnquist, which is as follows: A committee be appointed to consider the organization, function, and future emphasis of this NCR-2 committee and its relationship to other NCR committees concerned with related problems.

MOTION PASSED.

Director Volk indicated this committee has no specific membership, but that the Directors like to have the recommendation of the Administrative Advisor before sending people from other disciplines.

It was suggested the Executive Committee assume responsibility for appraising future objectives of the NCCBR committee and its relationship to other NCR committees.

Dr. Bauman then called for reports from standing committees:

REPORT OF THE SUB-COMMITTEE ON MEETING PLACE

Dr. Crane reported nearest dates to present ones available at the Sheraton-Chicago Hotel for next year's meeting were February 22 and 23.

M. S. Zuber MOVED these dates be accepted.

Seconded by E. J. Dollinger and PASSED.

REPORT OF THE SUB-COMMITTEE ON UNIFORM TESTS IN THE 900 MATURITY SERIES

Chairman Loeffel reported no uniform performance trials were conducted last year and none are planned for next year. This Sub-committee is cooperating in the MDM and genotype stability tests.

R. C. Lambert MOVED the report be accepted, seconded by F. A. Loeffel and PASSED

REPORT OF THE SUB-COMMITTEE ON UNIFORM TESTS IN THE 700-800 MATURITY SERIES

The 700-800 maturity three-way crosses were grown in ten states. The origin of the lines tested are as follows:

<u>Line</u>			
R217	(R168 x GE440)R168 BC2 S3	Mo.17	C103 x C1187-2
R218	(W22R x GE440)Oh43 BC2 S3	N7A	Oh7/SSS1
R220	(W187R x GE440)187-2 BC3 S3	N7B	Oh7/SSS1
H84	B37 x GE440	N8A	187-2/SSS1
H85	Synthetic B	N8B	187-2/SSS1
H86	Synthetic B	Oh61:6160	N15 x C103
H89	B14 x GE440	Oh61:6186	N.S. Syn.#1
H90	N6 x C182B	Oh61:6210	N.S. Syn.#1
Ia.63:1266	H.D.2271(SSS)	Mo.17 x C103	
Ia.63:1261	H.D.2479(SSS)	C103	
		N6	

Table 5.

Summary of agronomic data obtained in the uniform regional test of 700-800 maturity three-way crosses grown in ten states in 1965.

Pedigree	Acre yield cwt.	Moist %	Root %	Lodging Stalk %	Days to 50% silk	Silk % (7-24)	Dropped ears %	Ear ht. grade	Ears per 100 plants
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
(WF9 x Ey2) x R217	57.8	16.9	7	22	69	94	1	2.8	96
x R218	60.7	18.1	3	21	70	86	2	2.7	92
x R220	59.9	18.4	6	38	73	39	1	3.3	100
x B84	64.2	19.7	6	17	73	66	3	2.4	96
x B85	52.6	17.8	11	23	71	77	2	2.5	92
x B86	61.3	19.1	9	24	72	76	4	2.3	95
x B89	60.2	18.8	13	18	69 72	81	1	3.2	102
x B90	62.2	19.1	10	18	71	78	3	2.7	90
x Ia63:1255	63.6	17.6	5	34	72	64	1	3.4	100
x Ia63:1261	65.8	18.8	5	15	73	71	2	2.8	101
x Mo17	63.9	19.2	5	27	73	48	5	2.9	97
x N7A	64.8	18.2	10	26	72	80	0	2.5	99
x N7B	65.1	17.6	12	34	71	67	1	3.1	107
x N8A	60.2	17.3	7	30	73	50	7	3.0	103
x N8B	62.9	19.6	4	46	76	22	2	2.8	93
x Oa61:6160	64.4	20.0	4	29	74	35	6	3.1	93
x Oa61:6186	58.3	19.0	3	33	73	48	3	2.8	104
x Oa61:6210	53.4	19.6	5	47	75	33	1	3.2	95
x (Mo17 x C103)sel.	60.5	19.7	2	25	72	51	3	2.9	98
x C103	60.8	19.0	3	28	74	60	3	3.1	96
x N6	60.3	18.6	11	33	71	77	3	2.6	99
Mean	61.1	18.7	7	28	72	63	3	2.9	98

Table 5. (cont'd.)

Pedigree	Acre yield cwt.	Moist %	Root %	Lodging Stalk %	Days to 50% silk	Silk % (7-24)	Dropped ears %	Ear ht. grade	Ears per 100 plants
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
(Oh7N x B37) x R217	57.7	17.7	7	16	72	82	0	2.8	91
x R218	59.9	18.7	3	29	70	85	1	2.7	101
x R220	61.3	18.8	16	39	74	29	0	3.0	110
x H84	57.6	20.2	13	14	77	23	0	2.6	96
x H89	66.1	18.7	9	9	74	68	0	2.8	103
x H90	67.5	19.8	12	13	70	77	0	2.6	98
x Ia63:1255	70.7	18.1	4	23	75	32	0	3.2	102
x Ia63:1261	64.3	18.4	10	11	78	52	1	2.9	100
x Mo17	66.4	18.7	7	18	71	73	2	2.9	92
x M7A	65.6	18.7	13	22	72	55	1	2.8	99
x M7B	62.9	18.7	16	30	76	18	0	2.8	103
x M8A	61.6	18.4	11	26	74	33	1	3.2	105
x M8B	61.9	20.0	10	29	78	23	3	2.7	102
x Oh61:6160	70.9	20.1	8	26	73	32	3	2.8	98
x Oh61:6183	62.8	19.2	9	32	73	46	4	3.1	99
x Oh61:6210	61.1	19.1	19	33	77	12	1	3.5	110
x (Mo17 x Cl03)sel.	66.0	19.2	4	22	77	55	2	2.9	98
x Cl03	62.2	19.4	7	14	74	40	2	2.8	99
x N6	62.0	19.0	8	29	71	90	1	2.6	98
Mean	63.6	19.0	10	23	74	75	1	2.9	100

States providing data

Column

- (1) Ill., Ind., Ia., Kan., Ky., Mo., Neb., Ohio, Pa., and Va.
 (2) Ill., Ind., Ia., Kan., Ky., Mo., Neb., Ohio, Pa., and Va.
 (3) Ill., Ind., Ky., and Mo.
 (4) Ill., Ind., Ia., Ky., Mo., Neb., Ohio, Pa., and Va.
 (5) Ohio
 (6) Pa.
 (7) Ia., Neb., and Mo.
 (8) Ia., Ky., Mo., and Ohio.
 (9) Ohio and Va.

Summarized data are presented in Table 5. No three-way crosses were produced in 1965 for yield trials in 1966. Fourteen to seventeen lines were nominated for making three-way crosses. States nominating lines were Indiana, Iowa, Ohio, Pennsylvania and Wisconsin. Each state entering lines should send 50 seeds to J. H. Lonnquist for crossing with N7B x B37 and to W. A. Russell for crossing with Mol7 x N22A.

W. R. Findley
J. H. Lonnquist
L. H. Penny, Chairman

P. L. Crane MOVED the report be accepted, seconded by R. J. Lambert and PASSED.

REPORT OF THE SUB-COMMITTEE ON UNIFORM TESTS IN THE 400-600 MATURITY SERIES

1965 Trials

Fifteen inbred lines, nominated by seven states, were evaluated in 3-way testcross trials by nine states during 1965. Two single-cross testers were used, A239 x R181 and A622 x R158.

Pedigrees of these lines are given below.

<u>Line</u>	<u>Pedigree</u>	<u>Line</u>	<u>Pedigree</u>
A629	(V3 x WF9) WF9	H87	A295 x CI90A
632	(Mt42 x B14) B14 ₃	H88	Oh43 x CI90A
635	(ND203 x B14) B14 ₂	N9-1336	N6 x Hays Golden
MS92	(Oh40B x R53) R53	N8-1613	Barkers Reid Y.D.
Mich 64-1	(W10 x Oh40B)	NO-1030	M14 x 187-2
" 64-2	(Oh51 x Oh26)(A x W23)	Pa 41	
" 64-3	Ia SSS	SD15	Rec. Oh56A
YuBc-4	WF9 x M14		

A summary of the results from all states is given in table 6 and yield data is given by individual states in table 7. Growth conditions at the various test locations ranged from very good to poor. In the western area cool temperatures and excess rainfall generally prevailed during the early autumn delaying maturation and drying. General growth condition remarks for each state are given below.

<u>State</u>	<u>Growth Condition Remarks</u>
South Dakota	Very good. Cool autumn. Corn matured slowly.
Minnesota	Cool and wet conditions in late August and September delayed maturation and reduced yields of some entries.

Michigan	Generally dry.
Ohio	Generally poor. Drought in June and July. Excess moisture in fall.
Indiana	Very good, stalk breakage high.
Missouri	Excellent. Excess rainfall in September with some high winds.

1966 Trials

Thirteen lines nominated by four states have been crossed with two single-cross testers, A239 x R181 and WF9 x Oh43, by L. F. Bauman for 1966 evaluation. The lines and pedigrees follow.

<u>Line</u>	<u>Pedigree</u>	<u>Line</u>	<u>Pedigree</u>
A643	Ia SynA	H 89	R14 x GE 440
A646	Minn. Syn 3	Ind 8-17	Syn B
A648	Minn. Syn 3	Ind 59-13	Syn B
MS 57	W10 x Oh40B	Ind E43-5	Oh43
MS 100	(Oh40B x 38-11)MS1334	Pa 65-1	Clarage
MS2115	8-line Syn.*	Pa 65-2	Sprague Gehu Flint
Mich 65-1	(Oh50B x A)ND203		

* R59, R61, W10, W20, W23, Oh40B, N6, A.

1967 Trials

Nine lines have been nominated to this date for 1967 three-way evaluation.

<u>Line</u>	<u>Pedigree</u>
Ia 56-1237	Oh 40B x B8 ³
Ia 65-1240	L317 x B8 ³
Ia 65-1269	Stiff Stalk Syb.
Ia 65-1271	W10 x HP
Pa 423	Switzgale
Ind E153-2	
Ind E153-3	
Ind Syn C-13-1	Syn C (blight resistant)
Ind Syn C-14-2	Syn C (blight resistant)

Additional nominations will be accepted. Dr. E.C. Rossman will make the crosses with two testers, A239 x R181 and W64A x Oh43.

L. F. Bauman
E. C. Rossman
J. C. Sentz, Chairman

J. C. Sentz MOVED the report be accepted, seconded by M. S. Zuber and PASSED.

Table 6.

Performance Data Summary for North Central Regional Three-way Trials of the 400-600 Maturity Group. Grown in Nine States, 1965.

Item	Entry	Yield Bu/A	Moisture %	Root Lodged	Stalks Broken	Dropped Ears/100 Plants	Ear Height in.	Stand Days to 50% Silk	Days to 50% Pollen
		(1)	(1)	(2)	(3)	(4)	(5)	(6)	(8)
1.	(A239 x R181) x A632	103	21.9	2	19	4.1	43	95	42
2.	" " A635	96	19.8	1	12	1.0	42	98	—
3.	" " H87	92	21.3	5	23	1.6	45	93	44
4.	" " H88	96	24.1	2	7	1.6	42	94	37
5.	" " MS92	91	21.6	6	24	1.3	38	93	—
6.	" " Mich 64-2	91	24.0	6	38	3.0	46	94	—
7.	" " Mich 64-3	98	25.2	8	20	4.0	47	92	47
8.	" " H9-1336	101	21.9	6	11	1.0	44	95	—
9.	" " H8-1613	105	22.2	4	8	1.3	39	95	35
10.	" " MO-1030	104	23.3	18	18	3.7	49	73	46
11.	" " Pa41	92	20.2	2	16	2.9	40	94	31
12.	" " SD 15	98	21.0	8	26	1.3	43	94	39
13.	" " YuBc 4	95	22.0	8	20	1.0	39	97	37

Table 6 (continued)

Item	Entry	Yield Bu/A	Moisture %	Lodged %	Root %	Stalks Broken %	Dropped Plants	Ear Height in.	Stand %	Days to 50% Silk	Days to 50% Pollen
		(1)	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	
14.	A622 x R158 = T.	98	25.5	8	11	3.2	4.8	94	90	48	
15.	(A622 x R158) x A629	91	24.0	8	16	4.0	4.4	97	88	—	
16.	A632	98	23.8	4	16	4.8	4.6	98	88	42	
17.	" A635	98	22.0	6	7	1.8	4.2	95	85	41	
18.	" H87	93	24.9	11	14	4.2	4.7	98	88	44	
19.	" H88	91	25.6	6	11	1.3	4.6	95	89	42	
20.	" MS92	90	24.7	6	28	1.0	3.5	96	85	30	
21.	" Mich 64-1	87	23.8	3	13	3.3	4.6	96	88	47	
22.	" 64-2	92	27.5	6	35	2.2	5.0	95	90	51	
23.	" 64-3	84	27.6	9	19	5.4	4.9	93	89	45	
24.	" N9-1336	94	24.6	16	12	1.7	4.6	98	86	43	
25.	" N8-1613	104	25.4	14	8	3.0	4.2	96	91	36	
26.	" N0-1030	94	26.0	18	24	4.9	4.8	98	90	44	
27.	" Pa41	92	22.6	4	24	3.4	4.3	97	86	37	
28.	" SD 15	96	23.8	11	37	2.4	4.6	96	87	41	
29.	" Yu8c 4	90	23.8	14	15	1.9	3.9	97	89	37	
30.	Ohio H15	84	23.1	8	33	2.2	4.2	96	83	29	
31.	Ohio K24	92	23.7	4	28	3.3	3.8	93	84	33	

- (1) All states.
 (2) Minn., Mich., Ohio, Ind., Ia., Mo.
 (3) All states except Pennsylvania
 (4) S. Dak., Minn., Ia., Neb., Mo.
 (5) Minn., Ind., Mo.
 (6) Ohio, Ind., Ia., Mo.
 (7) Ohio. Days from flowering.
 (8) Minnesota. Days from July 1.

Table 7.

Yield by Individual States for North Central Regional Three-Way Trials of the 400-600 Matur Group, 1965.

Entry	S.Dak.	Minn.	Mich.	Pa.	Ohio	Ind.	Iowa	Neb.	Mo.
Bushels per Acre									
1. (A239 x R181) x A632	100	108	134	96	84	130	102	82	91
2. " A635	93	---	108	80	69	132	100	90	87
3. " H87	91	100	94	83	87	113	88	81	91
4. " H88	100	98	112	79	81	128	83	81	104
5. " MS92	91	---	90	82	57	119	99	95	86
6. " Mich 64-2	94	---	105	79	72	114	89	87	83
7. " Mich 64-3	90	101	105	94	84	130	88	96	90
8. " N9-1336	106	---	94	70	94	148	95	95	98
9. " N8-1613	97	106	128	94	96	140	92	97	96
10. " N0-1030	109	114	109	93	92	138	98	90	94
11. " Pa41	93	107	91	84	80	106	93	89	81
12. " SD 15	105	106	106	93	66	107	102	96	105
13. " YuBc 4	105	102	106	59	80	114	104	92	92
14. A622 x R158 = T ₂	102	102	115	94	58	133	97	102	84
15. (A622 x R158) x A629	97	---	95	93	53	120	86	94	80
16. " A632	90	106	100	98	85	139	97	86	84
17. " A635	93	100	108	96	86	128	96	92	81
18. " H87	96	98	88	81	92	130	84	78	91
19. " H88	96	98	94	89	69	132	82	68	92
20. (A622 x R158) x MS92	96	94	100	95	50	108	89	90	92
21. " Mich 64-1	92	89	93	89	67	121	72	74	88
22. " 64-2	95	97	94	84	68	111	90	96	90
23. " 64-3	87	98	90	103	64	94	70	64	82
24. " N9-1336	100	102	108	90	85	116	86	68	91
25. " N8-1613	106	108	105	95	92	133	96	108	89
26. " N0-1030	99	102	98	92	75	129	92	71	90
27. " Pa41	98	103	85	84	71	111	97	91	84
28. " SD 15	108	102	86	96	67	109	102	94	100
29. " YuBc 4	91	107	104	88	54	124	89	87	84
30. Ohio M15	93	93	80	80	77	83	84	87	76
31. Ohio K24	90	100	94	89	82	116	89	75	96
LSD (.05)	10.8	9.4	12.4	14.6	23.9	---	8.8	---	---
Mean	97	102	101	88	75	121	91	87	89
No. Reps.	4	4 (2 loc)	3	3	3	3	3	2	4
1,000 Plants/Acre	11.8	16 and 18	17.2	18	21	21.5	16	13	17

REPORT OF THE SUB-COMMITTEE ON UNIFORM TESTS IN THE
100-300 MATURITY SERIES

Wm. Wiidakas distributed tables 8 through 13 summarizing results of the 1965 uniform tests of 100-300 maturity. No uniform trials are planned for 1966. Seed of lines nominated for three-way combinations should be sent to A. M. Strommen.

Table 8. Yield trial of 100-300 three-way crosses. Minnesota 1965.

Hybrid	H ₂ O%	Bu/A.	Lodging		Dropped ears%	Appear- ance		Ear Length
			Stalk %	Root %		Plt.	Ear	
MS64-4 (A509 x MS1334)	23.7	109	19	0	0	1.5	2.5	8.2
MS64-5 "	26.7	95	5	3	0	2.0	3.0	8.4
MS64-6 "	26.0	104	30	0	2	3.0	2.0	8.2
SD10 "	24.4	102	13	0	0	2.5	3.0	8.6
SD12C "	21.7	101	10	0	0	2.5	2.0	9.2
SD14 "	20.0	96	18	0	0	2.5	2.5	8.5
Pa360 "	22.5	90	11	0	3	3.5	3.0	7.0
Pa362 "	21.6	104	7	7	0	3.0	2.5	7.0
PaW703 "	19.9	102	22	0	0	3.0	2.0	8.1
A554 "	22.9	109	7	3	0	2.5	3.0	6.8
A575 "	24.1	92	4	3	0	3.0	2.5	8.1
A624 "	24.5	104	12	0	0	2.5	2.0	8.1
CM36 "	21.0	84	12	0	0	3.5	3.0	7.6
CM37 "	23.8	94	4	0	0	3.5	2.5	6.9
CM50 "	20.0	91	7	0	0	3.5	2.0	7.4
ND405 "	25.7	95	16	0	0	2.5	3.0	8.6
ND407 "	24.1	103	11	0	0	3.5	2.5	8.5
ND408 "	24.1	99	5	0	0	2.0	3.0	8.1
W681 "	32.3	104	16	0	0	2.0	2.5	9.6
W649 "	20.7	107	18	0	0	2.5	2.0	8.6
W491 "	21.3	103	6	0	0	2.0	2.0	9.2
Wis. 273	23.3	87	2	0	2	3.0	4.0	7.6
A509 x MS1334	19.6	98	6	6	0	3.0	3.0	8.6

Table 9. Yield trial of 100-300 three-way crosses. Michigan 1965.

Hybrid	'Bu.per 'acre '15.5%	'Percent 'moisture	Percent Lodging	
			Stalk	Root
(A509 x MS1334) x Mich. 64-4	58.8	31.7	24.4	22.4
" x Mich. 64-5	62.7	28.4	20.1	21.7
" x Mich. 64-6	56.4	32.6	56.4	13.4
" x SD 10	58.0	27.5	22.0	9.3
" x SD 12 C	55.1	31.4	26.9	7.7
" x SD 14	51.9	27.5	46.5	12.5
" x Pa. 360	55.8	26.9	14.3	22.1
" x Pa. 362	58.3	30.2	13.9	7.9
" x ND 405	58.3	28.6	14.4	30.8
" x ND 407	65.1	28.7	15.8	18.6
" x ND 408	58.5	32.1	16.1	16.6
" x A554	59.8	26.4	9.4	21.8
" x A575	56.4	29.1	17.7	7.0
" x A624	54.2	29.3	26.6	16.9
" x CM36	47.2	26.4	23.7	5.1
" x CM37	42.5	32.5	17.1	5.3
" x CM50	57.0	26.1	26.5	17.5
" x W703	60.4	28.1	30.6	14.2
" x W491	57.2	30.5	26.2	26.2
" x W649	58.3	28.1	43.2	15.9
" x W681	49.1	38.5	28.3	35.1
Wis. 273	46.3	30.3	12.1	33.3

	Grand Traverse	Montcalm	Newaygo
Planted	May 14	May 17	May 19
Harvested	Nov. 16	Nov. 9	Nov. 4
Previous crop	Corn	Corn	Corn
Population	17,000	17,100	16,700
Rows	38 inch	36 inch	36 inch
Fertilizer	120-120-120	150-80-130	121-84-42
Soil test PH	6.8	6.8	7.2
P	49 (high)	118 (very high)	23 (medium)
K	113 (low)	136 (medium)	108 (low)

Table 10. Yield tirla of 100-300 three-way crosses. North Dakota 1965.

	Days to silk	Ear moisture percent			Acre yield bushel		
Top crosses with		Mandan	Fargo	Ave.	Mandan	Fargo	Ave.
A509 x MS 1334							
CM 36	62	34.1	37.5	35.8	56.9	76.2	66.6
CM 37	61	39.1	37.9	38.5	56.9	74.9	65.9
CM 50	65	33.5	34.1	33.8	57.0	74.8	65.9
W491	67	41.5	43.0	42.3	57.5	81.4	69.5
W649	66	38.8	38.7	38.8	60.2	77.7	69.0
W681	67	44.8	45.9	45.4	64.2	79.5	71.9
ND 405	67	38.1	40.0	39.1	62.1	75.0	68.6
ND 407	68	39.3	39.9	39.6	60.7	74.0	67.4
ND 408	68	42.1	42.0	42.1	63.0	73.0	68.0
A 554	66	37.7	39.5	38.6	60.7	77.1	68.9
A 575	65	38.1	38.1	38.1	63.6	75.6	69.6
A 624	68	40.1	39.7	39.9	65.5	82.8	74.2
SD 10	66	42.3	40.4	41.4	58.4	78.8	68.6
SD 12C	67	37.3	38.6	38.0	61.7	78.1	69.9
SD 14	67	33.6	36.0	34.8	62.5	74.2	68.4
SD 15	68	44.4	43.2	43.8	64.5	82.8	73.7
Pa 360	63	37.7	39.8	38.8	60.1	73.8	67.0
Pa 362	64	37.7	41.0	39.4	59.0	76.9	68.0
Pa W703	64	38.5	40.4	39.5	61.3	70.9	66.1
MS 64-4	69	43.6	42.9	43.3	61.1	79.8	70.5
MS 64-5	70	41.5	43.6	42.6	51.7	69.5	60.6
MD 64-6	70	41.7	44.1	42.9	65.1	76.4	70.8
ND 307	65	34.0	35.8	34.9	60.5	73.4	67.0

Mandan --- Planted May 12 ----Harvested October 1 ---- population 12,000

Fargo ---- Planted May 17 ----Harvested October 9 ----population 12,500

Table 10. (cont'd.)

Top crosses with	'Shell- 'ing ' %	'Lodging ' %	'Appearance 'comparative		'Av. height 'comparative		'Ear ' shank ' length	
	' %	'Plts.	Ears	'Plts.	Ears	' Plts.	Ears	' length
A509 x MS 1334								
CM 36	79.5	1	4	vg	g	mt	m	ms
CM 37	79.2	1	3	fg	g	my	m	m
CM 50	81.0	2	3	f	vg	mt	mh	ml
W 491	80.2	3	3	g	fg	t	h	ms
W 649	78.6	0	7	vg	g	t	vh	m
W 681	77.0	1	4	vg	g	t	vh	m
ND 405	77.4	0	4	fg	vg	t	mh	m
ND 407	77.9	0	5	g	vg	t	mh	ml
ND 408	79.9	0	4	vg	vg	vt	h	m
A 554	76.3	2	8	fg	vg	tm	m	lm
A 575	76.8	1	9	g	vg	mt	m	ml
A 624	78.2	2	10	vg	g	vt	mh	m
SD 10	78.2	1	6	g	g	tm	mh	ms
SD 120	80.0	0	6	vg	vg	mt	m	ms
SD 14	79.4	1	4	vg	vg	vt	h	ml
SD 15	77.8	1	6	vg	vg	vt	hm	m
Fa 360	79.2	2	6	fg	g	mt	m	m
Fa 362	78.0	3	6	f	f	m	ml	m
Fa W703	77.9	3	10	fg	gf	t	m	ms
MS 64-4	78.7	1	4	fg	g	vt	h	ml
MS 64-5	78.3	2	4	fg	g	vt	vh	ms
MS 64-6	79.4	2	6	g	vg	vt	vh	s
ND 307	77.2	2	5	f	fg	mt	m	ml

Mandan --- Planted May 12 --- Harvested October 1 --- population 12,000

Fargo --- Planted May 17 --- Harvested October 9 --- population 12,500

Table 11. Yield trial of 100-300 three-way crosses. South Dakota, 1965.

Hybrid		'Bu/per'		' %		' Stalk	
		'acre	' Moist.	' D. E.	'	' lodging	
(A509 x MSL334)	. SD 12C	57.5	29.4	0.0		7.4	
"	. SD 14	55.3	28.7	1.0		22.8	
"	. SD 10	52.0	35.9	0.0		0.6	
"	. SD 15	51.2	40.5	0.0		2.7	
"	. SD15 x A632	53.8	38.1	2.4		15.1	
SD 220		48.9	32.4	0.5		4.5	
(A509 x MSL334)	. W703	56.1	28.8	0.0		1.6	
"	. W491	51.8	32.9	0.0		1.4	
"	. W681	55.0	39.5	0.0		12.6	
"	. W649	56.5	28.9	0.0		3.4	
Wis. 273		40.5	34.6	0.0		0.6	
(A509 x MSL334)	. ND 405	57.3	31.2	0.0		4.3	
"	. ND 407	55.9	31.8	0.0		1.0	
"	. ND 408	48.9	35.3	0.0		0.6	
"	. A554	55.7	28.6	0.0		1.0	
"	. A575	56.5	32.2	0.0		0.0	
"	. A624	55.8	34.0	0.0		3.8	
"	. CM 36	51.7	23.9	0.0		3.4	
"	. CM 50	49.8	25.8	0.0		1.0	
"	. CM 37	49.1	33.0	0.0		1.0	
"	. Pa 360	51.6	31.4	0.0		1.0	
"	. Pa 362	52.0	27.6	0.0		0.5	
"	. MS 64-6	55.1	38.1	0.0		18.0	
"	. MS 64-4	52.0	35.9	0.5		4.8	
"	. MS 64-5	47.5	36.5	0.0		3.4	

Table 12. Yield trial of 100-300 three-way crosses. Pennsylvania 1965,

Hybrid		Bu.	% Moist.	Erect	Silk
		per acre		plants %	
(A509 x MS1334)	x Pa W703	90.5	25.6	48.1	100.1
"	x Pa 360	106.0	25.0	78.4	91.4
"	x Pa 362	109.0	26.4	91.5	97.8
"	x SD 12C	100.6	28.4	90.4	24.8
"	x SD 14	88.1	25.7	81.8	53.8
"	x SD 10	96.9	25.1	92.8	27.3
"	x W 681	113.5	28.2	85.6	22.1
"	x W 649	85.3	25.2	63.4	55.7
"	x W 491	102.3	28.3	76.1	42.1
"	x CM 37	88.8	27.2	97.4	92.3
"	x CM 50	87.6	24.9	82.3	104.2
"	x CM 36	88.5	25.2	81.3	96.0
"	x ND 407	99.1	27.0	92.2	51.4
"	x ND 405	108.9	27.5	97.2	53.6
"	x ND 408	117.4	27.7	90.4	40.8
"	x Mich 64-4	101.2	26.5	83.0	33.4
"	x Mich 64-5	101.9	26.3	99.7	12.9
"	x Mich 64-6	109.9	27.7	74.5	18.0
"	x A 554	92.7	25.8	92.4	80.1
"	x A 575	105.6	26.2	95.0	94.9
"	x A 624	99.9	27.7	70.5	21.3
(A509 x MS1334)		88.9	24.7	84.1	95.7
Pa 290		96.8	26.0	83.8	43.4
Wis. 335A		80.4	27.0	92.9	50.0
A495 x A509 x Pa32 x Pa33		88.4	25.2	95.6	54.9

Planted -- May 19---- Harvested Oct. 27 ----August---Percent plants silked

Plant population ----18,000-----Plot size ----1/500 acre----- Machine

planted and harvested (picker-sheller)---- 5 x 5 lattice square - 3 reps.

Table 13. Yield trial of 100-300 three-way crosses. Wisconsin 1965.

Hybrid	Bu. per acre	Mois- ture %	Shell- ing %	
A509 x MS1334 . MS64-4	74.0	51	73	
. MS64-5	65.2	52	73	
. MS64-6	83.2	47	73	
. SD 10	67.0	46	73	Tends to have bare ear tips
. SD 12C	79.9	48	76	
. SD 15	81.9	50	71	
. SD 14	72.7	39	74	Tends to have bare ear tips
. Pa 360	76.6	41	75	Tends to have bare ear tips
. Pa 362	73.1	44	73	Tends to have bare ear tips
. Pa W703	80.7	42	74	Tends to have bare ear tips
. ND 405	73.9	45	72	
. ND 407	70.7	44	73	
. ND 408	68.8	47	74	
. A554	75.2	40	72	
. A575	77.0	41	73	
. A624	81.7	44	71	Very good hybrid, V.good ear height
. CM 36	82.6	38	75	Earliest hybrid
. CM 37	81.2	41	74	Quite early, V.good hybrid, uniform
. CM 50	76.2	37	77	
. W681	81.3	50	71	Very large ear, very late
. W649	85.5	45	74	Ex. uniform hybrid
. W491	66.0	54	74	Too many tillers
. W729D	85.2	42	74	Good

Planting date ----- May 15

Harvesting date ----- October 15

Average of 3 reps.

W. Wiidakas MOVED the report be accepted, seconded by J. C. Sentz and PASSED.

REPORT OF THE SUB-COMMITTEE ON MAIZE DWARF MOSAIC VIRUS

New lines nominated for uniform tests will be screened for resistance to virus in Ohio, Kentucky, Indiana, Illinois, and Missouri, listed in order of priority for receiving seed. Respective quantities of seeds needed are 30-50, 50, 75-100, 52-100, and 100. A series of R x S single crosses will be grown at all locations to obtain additional information on genotype-environmental interactions.

Diallel sets involving 10 lines, seven resistant and three susceptible, will be made of yellow in the 700-800 and 900 maturity series and of white in the 900 maturity series. A few R x S combinations will be advanced to the F₂, BC₁ and BC₂ generations for inheritance studies.

F. A. Loeffel
A. J. Ullstrup
W. R. Findley, Chairman

W. R. Findley MOVED the report be accepted, seconded by P. L. Crane and PASSED.

It was suggested that 100 seeds of all new lines entered in uniform tests be sent to Paul Fitzgerald for rootworm evaluation.

REPORT OF THE SUB-COMMITTEE ON STABILITY AND GENOTYPE-ENVIRONMENTAL RESPONSES OF HYBRID TYPES

Dr. Russell stated the stability and genotype-environment tests was grown at 12 locations in 10 states in 1965. Seed for the 1966 trials will be distributed soon. The test is combined in the same form as in 1965. Hand planting, thinning and harvesting are requested. Continue to send yield data in in pounds per plot. The computer program will convert it to kilograms per hectare. Data are needed on both root lodged and stalk lodged plants, not on percent erect plants.

W. A. Russell MOVED the report be accepted, seconded by M. S. Zuber and PASSED.

Plans were made to grow a uniform set of 400-500-600 maturity inbreds at four locations; one each in Canada, Indiana, Michigan, and Ohio to obtain information on their reaction to red streak of grain. Included will be some white endosperm and white cobbled types. A total of 50 lines will be grown. A list of lines each State wishes to include is to be sent to W. R. Findley with order of preference listed. Once the list of lines to be tested is determined, 50 seeds of each are to be sent to each cooperator.

PENNSYLVANIA'S MINERAL ACCUMULATION STUDIES

Dr. M. W. Johnson thanked members of the committee, on behalf of Dr. W. I. Thomas, for their cooperation the past two years in their chemical leaf accumulation x location study. Following is a preliminary report of the results of these tests. Dr. Thomas will distribute complete information when analysis of the data is completed.

Analysis of leaf tissue from the high and low accumulating hybrids of P, K, Mg, Ca, Sr and Zn has been completed. Differences between high and low accumulators of all elements were generally significant at most locations and when not significant were high or low as expected. The extremes for all elements with the location and year are given below:

Early Hybrids

State	High Year	Element	State	Low Year	Element
Michigan	1964	1.095% P	Penna.	1965	.198% P
Penna.	1965	1.60% Ca	So. Dakota	1964	.42 % Ca
Michigan	1964	3.15% K	Michigan	1965	1.19 % K
Michigan	1965	.758% Mg	Penna.	1964	.102% Mg
Michigan	1964	26 ppm Sr	Michigan	1964	3 ppm Sr
Michigan	1964	66 ppm Zn	So. Dakota	1965	12 ppm Zn

Late Hybrids

Kentucky	1964	.860% P	Iowa	1965	.217% P
Ohio	1965	1.24% Ca	Illinois	1965	.45 % Ca
Kentucky	1964	2.76% K	Iowa	1965	.91 % K
Iowa	1965	.696% Mg	Maryland	1965	.117% Mg
Iowa &	1964	15 ppm Sr	Indiana	1965	3 ppm Sr
Kentucky	1965	15 ppm Sr			
Missouri	1964	54 ppm Zn	Maryland	1965	14 ppm Zn

The most significant item derived from these data is that use of leaf analyses for making fertilizer recommendations have little merit without previous knowledge of the hybrid as well as the soil.

When soil analyses are completed, summary data will be furnished to all cooperating states.

W. I. Thomas
M. W. Johnson
D. E. Baker

The Chairman then called for a report of the Nominating Committee. The committee proposed the name of Dr. R. J. Lambert to serve as the new member of the Executive Committee. There being no nominations from the floor the Secretary was instructed to cast a unanimous ballot for Dr. Lambert.

Chairman Bauman then thanked the Chairmen of the standing sub-committees for their contributions during the year and to the program. He also thanked the speakers for their participation.

There being no further business P. L. Crane MOVED for adjournment. The motion was seconded by J. C. Sentz and PASSED.

The Executive committee convened immediately. A. L. Hooker was elected Chairman for 1967. This committee will investigate future objectives of the North Central Corn Breeding Research Committee and its relationship to other committees with related interests. Committee appointments were reviewed and the new standing committees are attached.

OFFICERS AND COMMITTEE MEMBERSHIP FOR 1966-1967
Administrative Advisor
N. J. Volk

EXECUTIVE COMMITTEE

L. F. Bauman	1963-1967
A. L. Hooker, Chairman	1964-1968
A. R. Hallauer	1965-1969
R. J. Lambert	1966-1970

Sub-Committees for 1966-1967

Grouping of Lines for Breeding Purposes.

L. F. Bauman, N. P. Neal, W. A. Russell, Chairman

Meeting Place

D. B. Shank, M. S. Zuber, W. A. Russell, P. L. Crane, Chairman

Uniform Tests in the 900 Maturity Series.

P. J. Loesch, C. E. Wassom, M. S. Zuber, F. A. Loeffel, Chairman

Uniform Tests in the 700-800 Maturity Series.

W. R. Findley, J. H. Lonnquist, L. H. Penny, Chairman

Uniform Tests in the 400-600 Maturity Series.

L. F. Bauman, E. C. Rossman, D. B. Shank, Chairman

Uniform Tests in the 100-300 Maturity Series.

Wm. Wiidakas, A. M. Strommen, Chairman

Uniform Tests on Stability and Genotype-Environmental Response of Hybrid Types.

E. R. Leng, E. C. Rossman, M. S. Zuber, S. A. Eberhart, Chairman

Uniform Tests on Corn Rootworm.

G. E. Scott, V. L. Fergason, P. J. Fitzgerald, Chairman

Uniform Tests on Maize Dwarf Mosaic.

F. A. Loeffel, A. J. Ullstrup, W. R. Findley, Chairman

ROSTER OF ATTENDANCE

Canada

Copper, James	University of Guelph	Guelph
Gamble, E. E.	" "	"
Kannenberg, L. W.	" "	"

Illinois

Dudley, J. W.	University of Illinois	Urbana
Hocker, A. L.	" "	"
Lambert, R. J.	" "	"

Indiana

Bauman, L. F.	Purdue University	Lafayette
Crane, P. L.	" "	"
Ullstrup, A. J.	ARS-USDA	"

Iowa

Clark, R. L.	ARS-USDA	Ames
Russell, W. A.	Iowa State University	"
Skrdla, W. H.	ARS-USDA	"

Kansas

Wassom, C. E.	Kansas State University	Manhattan
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Kentucky

Loeffel, F. A.	University of Kentucky	Lexington
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Michigan

Rossman, E. C.	Michigan State University	E. Lansing
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Minnesota

Sentz, J. C.	University of Minnesota	St. Paul
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Missouri

Ferguson, V. L.	ARS-USDA	Columbia
Loesch, P. J.	" "	"
Zuber, M. S.	" "	"

Nebraska

Lonnquist, J. H.	University of Nebraska	Lincoln
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North Dakota

Wm. Willadas	N. D. State University	Fargo
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Ohio

Dollinger, E. J.	Ohio Agr. Res. & Dev. Center	Wooster
Findley, W. R.	ARS-USDA	"
Williams, L. E.	Ohio Agr. Res. & Dev. Center	"

Pennsylvania

Johnson, M. W.	Penn State University	Univ. Park
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South Dakota

Shank, D. B.	S. D. State University	Brookings
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Wisconsin

Bansal, R. K.	University of Wisconsin	Madison
Davis, J. R.	" "	"
Hoppe, P. E.	ARS-USDA	"
Kavacs, I.	University of Wisconsin	"
Neal, N. P.	" "	"
Shah, R. M.	" "	"

